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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,290	08/17/2001	Donald Craig Foster	M-11313 US	4763
22888	7590	05/26/2004	EXAMINER	
BEVER HOFFMAN & HARMS, LLP TRI-VALLEY OFFICE 1432 CONCANNON BLVD., BLDG. G LIVERMORE, CA 94550			GRAYBILL, DAVID E	
			ART UNIT	PAPER NUMBER
			2827	

DATE MAILED: 05/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/932,290

Applicant(s)

FOSTER, DONALD CRAIG

Examiner

David E Graybill

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) 2,13,18,25 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,14-17,19-24,26-31 and 33-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3 sheets</u> . | 6) <input type="checkbox"/> Other: _____ |

The reply filed on 2-26-4 is not fully responsive to the prior Office action because it fails to include a listing of all claims readable on the elected species.

Because the response appears to be bona fide, but through an apparent oversight or inadvertence the response is incomplete, and in order to continue to afford applicant the benefit of compact prosecution, the requirement to complete the response within a one month time limit is waived, the amendment is entered, and the claims are examined on the merits.

Applicant's election of the species wherein the second distance is approximately zero, in the paper filed on 2-26-4, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the features of claims 21, 27 and 49 must be shown or the feature canceled from the claims. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8, 23 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 8, 23 and 24 there is insufficient antecedent basis for the language "the conductors," "the conductors," and "said conductors," respectively.

In the rejections infra, generally, reference labels are recited only for the first recitation of identical claim elements.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 6-12, 14, 16, 17, 19, 23, 24, 29, 30, 31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka (JP10135399) and Tanaka (JP61170053).

In the English abstracts, English translation and drawings, Tanaka '399 discloses the following:

A leadframe comprising: a plurality of leads, each lead comprising a first surface, an opposite second surface, and an inner end segment 19 beginning at an inner end of the lead, wherein a first subset of the leads each include a recess 19a in the first surface of the lead at the inner end segment, a second subset of the leads, and the individual leads of the first subset are situated in an alternating lateral pattern with the individual leads of the second subset; a plurality of electrical conductors 24, wherein the inner end segments are respectively electrically connected to a semiconductor chip 22 by one of said conductors; where at least some of the conductors 24a are respectively electrically connected within the recess of the respective inner end segment.

A leadframe comprising: a plurality of pairs of adjacent metal leads, wherein each lead includes an inner end segment beginning at an inner end of the lead, said inner end segments including a recessed surface; a plurality of electrical conductors, wherein the inner end segments of the leads are respectively electrically connected to a semiconductor chip by one of said

conductors, and at least some of said conductors are connected to the recessed surface of the respective inner end segment; a dam bar 16, wherein the leads extend from a dam bar.

A leadframe comprising: a plurality of adjacent pairs of leads each including an inner end segment beginning at an inner end of the lead, wherein the inner end segments include a recessed surface, ; a plurality of electrical conductors, wherein the inner end segments of the pairs of adjacent leads are respectively electrically connected to a semiconductor chip by one of said conductors, and at least some of said conductors are connected to the recessed surface of the respective inner end segment.

A semiconductor package comprising: a plurality of adjacent pairs of leads each including an inner end segment beginning at an inner end of the lead, wherein the inner end segments include a recessed surface; a semiconductor chip in an electrical connection with the inner end segments of the leads; and a hardened encapsulant material 26 covering the semiconductor chip, the conductors, and the inner end segments of the leads; wherein the electrical connection comprises a plurality of electrical connectors bonded between the semiconductor chip and the inner end segments, wherein at least some of said conductors are bonded to the recessed surface of the respective inner end segment.

A semiconductor package comprising: a plurality of pairs of adjacent metal leads, wherein each lead includes an inner end segment beginning at an inner end of the lead, said inner end segments including a recessed surface; a semiconductor chip in an electrical connection with the inner end segments of the leads; and a hardened encapsulant material covering the semiconductor chip, the conductors, and the inner end segments of the leads; wherein the electrical connection comprises a plurality of metal wires bonded between the semiconductor chip and the inner end segments, wherein at least some of said wires are bonded to the recessed surface of the respective inner end segment.

However, Tanaka '399 does not appear to explicitly disclose wherein a second subset of the leads each include a recess in the second surface of the lead at the inner end segment; said inner end segments each including a recessed surface; wherein each recess has a vertical depth that is more than half of a vertical height of the lead.

Nonetheless, in the English abstract and drawings, Tanaka '053 discloses wherein leads each include a recess in the second surface of the lead at the inner end segment 2; said inner end segments each including a recessed surface; wherein each recess has a vertical depth that is more than half of a vertical height of the lead. Moreover, it would have been obvious to combine the product of Tanaka '053 with the product of Tanaka '399 so that

the second subset of the leads each include a recess in the second surface of the lead at the inner end segment (see Drawing 3), and wherein each recess of has a vertical depth that is more than half of a vertical height of the lead, because it would provide a narrow lead interval which is disclosed as desirable by both Tanaka '399 and Tanaka '053.

However, the combination of applied prior art does not appear to explicitly disclose that the leads are situated such that the recesses in the inner end segments of the leads of each pair of adjacent leads are oriented in opposite directions; wherein the recessed surfaces of the leads of each said pair of adjacent leads are spaced apart a first distance in a vertical direction; wherein the first distance is greater than half a vertical height of an unrecessed portion of the lead; and the recessed surfaces of the inner end segments of the leads of each of the pairs are oppositely oriented.

Nevertheless, these limitations are inherent properties of the product of the combination of applied prior art.

Also, the combination of applied prior art does not appear to explicitly disclose wherein the second distance is approximately zero; and wherein the second distance is zero.

Regardless, both Tanaka '399 and Tanaka '053 disclose the desirability of narrow lead intervals; thus, they disclose that horizontal lead distance is a result-effective variable. Moreover, it would have been an obvious matter of

design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose the particular claimed horizontal lead distance limitations because applicant has not disclosed that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another distance. Indeed, it has been held that optimization of range limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See MPEP 2144.05(II): "Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. '[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.'" In re Aller, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). See also In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969), Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989), and In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990). As set forth in MPEP 2144.05(III), "Applicant can rebut a prima facie case of obviousness based on overlapping ranges by showing the

criticality of the claimed range. 'The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.' In *re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP § 716.02 - § 716.02(g) for a discussion of criticality and unexpected results." Similarly, it has been held that mere dimensional limitations are *prima facie* obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Furthermore, although the combination of applied prior art does not appear to explicitly disclose that the first distance is greater than a second distance in a horizontal direction between closest portions of the recessed surfaces of the leads of each of the pairs of adjacent leads, this is an inherent property of the product of the combination of applied prior art

because the first distance is inherently greater than the second distance of approximately zero.

Claims 4, 5, 22, 28, 35, 40, 43, 46 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Tanaka and Tanaka as applied to claims 1, 9, 17, 23 and 29, and further in combination with Tanigawa (JP03245560).

As cited supra, Tanaka '399 discloses wherein the leads include a first portion between the inner end segment and a dam bar of the leadframe.

However, the combination of Tanaka and Tanaka do not appear to explicitly disclose wherein a width of the inner end segments at the respective recess is greater than a width of the first portion of the leads; wherein a width of the inner end segments at the respective recess therein is greater than a width of the lead outward of the inner end segment; wherein a width of the inner end segment is greater than a width of the lead outward of the inner end segment; wherein the inner ends of the leads of the first subset extend further toward a center of the leadframe than the inner ends of the leads of the second subset; wherein the inner end of one lead of each said pair extends further toward a center of the leadframe than the inner end of the other lead of the pair; wherein the inner end of one lead of each said pair extends further toward the semiconductor chip than the inner end of the other lead of the pair.

Still, in the English abstract and drawings, Tanigawa discloses wherein a width of the inner end segments 4 is greater than a width of the first portion 5 of the leads 3; wherein a width of the inner end segments is greater than a width 5 of the lead outward of the inner end segment; and wherein a width of the inner end segment is greater than a width of the lead outward of the inner end segment; wherein the inner ends of the leads of a first subset extend further toward a center of the leadframe 1 than the inner ends of the leads of a second subset; wherein the inner end of one lead of each of a pair extends further toward a center of the leadframe than the inner end of the other lead of the pair.

In addition, it would have been obvious to combine this product of Tanigawa with the product of the combination of Tanaka and Tanaka because it would provide a desirable narrow lead interval.

Claims 36, 38, 41, 44, 47 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Tanaka and Tanaka as applied to claims 1, 9, 17, 23 and 29, and further in combination with Miyamoto (JP03024754).

As cited supra, the combination of Tanaka and Tanaka discloses wherein the recesses of the second subset of the leads extend to the inner end of the lead; wherein the recessed surface of the other lead of the pair extends to the inner end of the lead.

However the combination of Tanaka and Tanaka do not appear to explicitly disclose where the inner end segments of the leads of the first subset include a pedestal between the inner end of the lead and the recess; wherein one lead of each said pair includes a pedestal between the inner end of the lead and the recessed surface.

Notwithstanding, in the English abstract and drawings, Miyamoto discloses where the inner end segments of the leads 2 of a first subset include a pedestal 2b between the inner end of the lead and the recess 2a; wherein one lead of a pair includes a pedestal between the inner end of the lead and the recessed surface. Furthermore, it would have been obvious to combine this product with the product of the applied prior art because it would enable stable loop formation.

Claims 37, 39, 42, 45, 48, 49 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Tanaka, Tanaka and Miyamoto, as applied to claims 36, 38, 41, 44, 47 and 50, and further in combination with Handa (JP59129451).

As cited, the combination of Tanaka, Tanaka and Miyamoto inherently discloses wherein the electrical connection to the lead of the pair having the pedestal is located at the pedestal because the pedestal is inherently electrically connected to the lead.

However, the combination of Tanaka, Tanaka and Miyamoto does not appear to explicitly disclose wherein the inner ends of the leads of the first subset extend further toward a center of the leadframe than the inner ends of the leads of the second subset; wherein the inner end of one lead of each said pair extends further toward a center of the leadframe than the inner end of the other lead of the pair.

Regardless, in the English abstract and drawings, Handa discloses wherein the inner ends of the leads 5 of a first subset extend further toward a center of a leadframe than the inner ends of the leads 6 of the second subset; wherein the inner end of one lead of each said pair extends further toward a center of the leadframe than the inner end of the other lead of the pair. Moreover, it would have been obvious to combine this product of Handa with the product of the applied prior art because it would improve connection reliability.

Claims 3, 15, 20, 26 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Tanaka and Tanaka as applied to claims 1, 9, 17, 23 and 29, and further in combination with Miyamoto (JP03024754) and Handa (JP59129451).

The combination of Tanaka and Tanaka does not appear to explicitly disclose wherein the recess of the inner end segment of the leads of the first subset does not extend to the inner end of the lead, and the leads of the

first subset extend further toward a center of the leadframe than the leads of the second subset; wherein the recessed surface of one of the leads of the pairs does not extend to the inner end of the lead, and those leads extend further toward a center of the leadframe than the other lead of the respective pair; wherein the recessed surface of one of the leads of the pairs does not extend to the inner end of the lead, and those leads extend further toward the semiconductor chip than the other lead of the respective pair.

Nonetheless, as cited supra, Miyamoto and Handa disclose these limitations, and they are applied to the rejection for the same reasons they were applied to the rejection of claims 37, 39, 42, 45, 48 and 51.

Claims 17, 20 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Gursky (4283839).

At column 6, lines 5-30; and column 7, lines 20-44, Gursky discloses the following:

A leadframe comprising: a plurality of adjacent pairs of leads 28, 30 each including an inner end segment beginning at an inner end 36 of the lead, wherein the inner end segments each include a recessed surface 44, and the recessed surfaces of the inner end segments of the leads of each of the pairs are oppositely oriented; wherein the recessed surface of one of the leads (28 or 30) of the pairs does not extend to the inner end of the lead, and those leads extend further toward a "center" of the leadframe than the

other lead (the other of 28 or 30) of the respective pair; wherein a semiconductor chip 52 is in a flip chip electrical connection with the inner end segments.

To further clarify the disclosure that those leads (28 or 30) extend further toward a center of the leadframe than the other lead (the other of 28 or 30) of the respective pair, it is noted that lead 28 extends a greater distance toward the center than lead 30, and lead 30 extends to a more advanced point toward the center than lead 28.

Claims 23 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Gursky (4283839) and Drees (4026008).

As cited supra, Gursky discloses a semiconductor package comprising: a plurality of adjacent pairs of leads each including an inner end segment beginning at an inner end of the lead, wherein the inner end segments each include a recessed surface, and the recessed surfaces of the inner end segments of the leads of each of the pairs are oppositely oriented; a semiconductor chip in an electrical connection with the inner end segments of the leads; and an encapsulant material; wherein the semiconductor chip is in a flip chip electrical connection with the inner end segments.

To further clarify the disclosure of an encapsulant material, Gursky discloses "encapsulation steps," and an encapsulant material is an inherent result of the encapsulation steps.

However, Gursky does not appear to explicitly disclose a hardened encapsulant material covering the semiconductor chip, the conductors, and the inner end segments of the leads.

Still, at column 6, lines 5-55, Drees discloses a hardened encapsulant material 19 covering the semiconductor chip 17, the conductors 18, and the inner end segments of the leads. Furthermore, it would have been obvious to combine this product of Drees with the product of Gursky because it would enable the encapsulation of Gursky.

To further clarify the disclosure of a hardened encapsulant material this is an inherent result of the "injection molding process" of Drees.

The art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

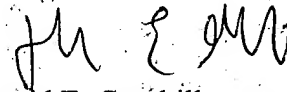
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Any telephone inquiry of a general nature or relating to the status (MPEP 203.08) of this application or proceeding should be directed to Group 2800 Customer Service whose telephone number is 571-272-2815.

Art Unit: 2827

Any telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (571) 272-1930. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is (703) 872-9306.



David E. Graybill
Primary Examiner
Art Unit 2827

D.G.
14-May-04